

Claims

[c1] 1. An apparatus for laser annealing an amorphous silicon film, said amorphous silicon film including a first region and a second region not overlapped with said first region, said apparatus comprising:

 a laser beam source module providing a laser beam;

 a beam splitter, disposed on a path of said laser beam, splitting said laser beam into a first laser beam and a second laser beam;

 a first photomask disposed on an optical path of said first laser beam and in front of said amorphous silicon film; and

 a second photomask disposed on an optical path of said second laser beam and in front of said amorphous silicon film;

 wherein said first laser beam is emitted to said first region, and said second laser beam is emitted to said amorphous silicon film in said second region after said amorphous silicon film in said first region is recrystallized.

[c2] 2. The apparatus of claim 1, wherein an optical path length of said first laser beam to said first region is

smaller than an optical path length of said second laser beam to said second region.

- [c3] 3. The apparatus of claim 1, further comprising a time delay device disposed on said optical path of said second laser beam.
- [c4] 4. The apparatus of claim 1, wherein said laser beam source module includes an excimer laser beam source module.
- [c5] 5. The apparatus of claim 1, wherein said laser beam source module includes a plurality of laser beam sources.
- [c6] 6. The apparatus of claim 1, wherein said first photomask includes a plurality of first stripe non-transparent regions parallel to each other, said plurality of first stripe non-transparent regions being grille-arranged, said plurality of first stripe non-transparent regions in a position corresponding to said second region.
- [c7] 7. The apparatus of claim 1, wherein said second photomask includes a plurality of second stripe non-transparent regions parallel to each other, said plurality of second stripe non-transparent regions being grille-arranged, said plurality of second stripe non-transparent regions in a position corresponding to said first region.

- [c8] 8. The apparatus of claim 1, wherein said first photomask includes a plurality of first rectangular transparent regions, said plurality of first rectangular transparent regions being area array arranged, said plurality of first rectangular transparent regions in a position corresponding to said first region.
- [c9] 9. The apparatus of claim 1, wherein said second photomask includes a plurality of second rectangular transparent regions, said plurality of second rectangular transparent regions being area array arranged, said plurality of second rectangular transparent regions in a position corresponding to said second region.
- [c10] 10. The apparatus of claim 1, further comprising a first lens module and a second lens module disposed on said optical path of said first and second laser beams respectively and in front of said first and second photomasks respectively.
- [c11] 11. The apparatus of claim 1, further comprising a projecting module disposed on said optical path of said first and second laser beams and behind said first and second photomasks.
- [c12] 12. The apparatus of claim 1, further comprising a plurality of reflectors disposed on said optical path of said

first and second laser beams.

- [c13] 13. A method for annealing an amorphous silicon film, said amorphous silicon film including a first region and a second region not overlapped with said first region, said method comprising:
 - splitting a laser beam into a first laser beam and a second laser beam;
 - emitting said first laser beam to said first region of said amorphous silicon film; and
 - emitting said second laser beam to said second region of said amorphous silicon film, after said amorphous silicon film in said first region is recrystallized.
- [c14] 14. The method of claim 13, wherein an optical path length of said first laser beam to said first region is smaller than an optical path length of said second laser beam to said second region.
- [c15] 15. The method of claim 13, wherein said step of emitting said first laser beam to said first region of said amorphous silicon film includes: providing a first photomask on an optical path of said first laser beam so that said first laser beam passes through said first photomask to said first region.
- [c16] 16. The method of claim 13, wherein said step of emit-

ting said second laser beam to said second region of said amorphous silicon film includes: providing a second photomask on an optical path of said second laser beam so that said second laser beam passes through said second photomask to said second region.

[c17] 17. The method of claim 13, wherein said laser beam includes an excimer laser beam.